

Framework of E-Banking and Factors Affecting the Service Quality of Banks

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ABSTRACT

In order to expand and also to achieve higher growth, banks are resorting to and progressing well using E-banking services. Actually, the expansion of internet has altered the way business is done and clients are approached and serviced. Quality of services, however, poses a major challenge and may prove a major roadblock for any bank. An effort has been made in the present research work to study the various factors affecting the service quality and also the effect of these factors on various demographic variables. The data have been collected from 200 customers from five select banks namely; State Bank of India, Punjab National Bank, HDFC Bank, AXIS Bank & ICICI Banks and analyzed with the help of the SPSS 13 software using data reduction technique i.e. factor analysis, ANOVA and also discriminant analysis. The results of the study indicate that twenty variables used may be reduced to seven factors i.e. authentication and authorization, acceptability, security, accessibility, promotional services, competitive advantage, data integrity and ease of use. It is worth noting that customers are concerned with authentication and authorization, acceptability and data integrity as most important factors for E-banking. The study also revealed that there is significant relationship between demographic variables (age, gender, occupation, education) and the different factors that respondents consider important while ascertaining service quality through E-banking.

Keywords: E-Banking, Service Quality, Internet, Factor Analysis, ANOVA, Discriminant Analysis

1. Introduction

In this era of cut throat competition net banking is being used to expand and reach every possible customer, specially the young and tech-savvy ones. It is not only a fad but convenience to customers. Electronic-banking / Internet banking/Net banking what ever you may use in common parlance is nothing but a field that includes information technologies and computer based innovations to provide various services in banking sector.

The conception and span of E-banking is still in the intermediary stage in India. It is enhancing the competence in the area of efficient disbursement and book-keeping system, thereby, improving the swiftness in delivery of banking services significantly. Incredible advancement in the area of Information technology has abridged the world to a global village and it has led to exceptional changes in the banking industry. Gigantic expansion in the tools of telecommunication and Electronic Data Processing (EDP) has further provided impetus to these changes. According to Christopher et al. (2006), E-banking has become an important channel to sell the products and services and is perceived to be a necessity in order to stay profitable & successful.

As per prediction of Broadie et al. (2007), the E-banking is leading to a paradigm shift in marketing practices resulting in high performance in the banking industry. Actually computerization and internet has transfigured fiscal and banking sectors globally and India is no exception.

Since the products presented to the customers of a bank are more or less uniform in nature, banks are sensing the emergence to differentiate themselves from the competitors on various criteria that can enhance customer contentment, loyalty and allegiance. This is because, customer contentment and allegiance has been considered to be of utmost importance for a firm's performance in the long run (Hallowell, 1996). Though, nearly all of the online service providers find it a hard job to handle service quality, because of the insufficient exposure to this new means of business operations and their limited knowledge of online consumer behavior (Mols, 2000). Actually, delivery of service in banking can be provided efficiently only when both the front as well as back end operations are efficient. Quality of services, however, poses a major challenge and may prove a major roadblock for any bank. An effort has been made in the present research work to study the various factors affecting

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the service quality and also the effect of these factors on various demographic variables.

2. Review of Literature

There have been numerous studies identifying the key service quality dimensions in the traditional banking environment, relatively little literature has investigated service quality attributes in the Internet banking industry (Jun and Cai, 2001).

Gronroos, (1982) described the total service quality as customer's perception of difference between the expected service and the perceived service. Further, he defined the concept of perceived service quality as the outcome of an evaluation process, where the consumer compares his expectations with the service he perceives or has received. Lehtinen and Lehtinen, (1982) also state that service quality has three dimensions, however the differences can be seen as (i) Physical quality: This includes items such as the condition of buildings and enabling equipment; (ii) Corporate quality: This refers to the organization's image and profile and; (iii) Interactive quality: This is derived from the interaction between service organizations' personnel and the customer as well as the interaction between customers.

Parasuraman et al., (1988) proposed that higher levels of perceived service quality result in increased customer satisfaction. Several studies in the past have paid much attention to the close relationship between service quality and customer satisfaction (Parasuraman et al., 1988 and Bitner et al., 1990). Hurley and Estelami, (1998) reported that while service quality and satisfaction are distinct constructs, a causal relationship exists between the two, and that perceptions of service quality affect feelings of satisfaction which, in turn, influence future purchase behaviour.

Several researchers have found that internet banking is fast gaining popularity in India (Gupta, 1999; Pegu, 2000), there has to be sufficient number of users and infrastructure in place to reach a critical mass. As for internet banking, Joseph et al., (1999) investigate the influence of internet on the delivery of banking service. Their study identifies six underlying dimensions of electronic banking service quality. They are convenience and accuracy; feedback and complaint management; efficiency; queue management; accessibility and customization. Lassar et al., (2000) investigated the impact of service quality on customer satisfaction in private banking by using the SERVQUAL. They reported that customer satisfaction is a multidimensional construct and its dimensions will have differential impact on the service quality dimensions.

Customer satisfaction in the online environment is referred as "e-satisfaction". Drawing upon the traditional service quality scale, Zeithaml et al., (2000) have developed e-service quality dimensions for measuring e-service quality. Jun and Cai, (2001) have identified seventeen service quality dimensions of internet banking. These are reliability, responsiveness, competence, courtesy, credibility, access,

and communication, understanding the customer, collaboration and continuous improvement, content, accuracy, eases of use, timeliness, aesthetics, security and diverse features. High standard e-service quality is the means by which the potential benefits of the internet can be realized (Yang et al., 2001).

A majority of studies view the dimensions of e-service quality as antecedents of e-satisfaction (Dina et al., 2004). Al-Hawari and Ward, (2006) demonstrated that service quality carries a significant impact on customer satisfaction which in turn affects the financial performance of banks. Khan et al., (2009) conducted a research study to evaluate the service quality of internet banking services in India from customer's perspective. They developed a battery of 26 items which were condensed to seven quality dimensions: reliability, accessibility, user friendliness, privacy/security, efficiency, responsiveness and fulfilment. The impact of these seven dimensions on the overall internet banking service quality was empirically tested, and all the dimensions except user friendliness and fulfilment were found statistically significant. Malhotra and Singh, (2006) found that only 48 per cent of the commercial banks operating in India as on March-end 2005 offer internet banking. In this context, the present research study is undertaken to investigate the factors affecting the service quality of banks on various demographic variables of E-banking customers.

Unnithan and Swatman, (2001) studied the key change drivers in the evolution of the banking sector, and the shift towards internet banking in India. They reported that in India, less inclination towards E-banking is because of various factors like having weak infrastructure, low personal computer penetration, developing security protocols and consumer reluctance in rural sector. In a theoretical study, Rao and Prathima, (2003) found that as compared to the banks abroad, Indian banks offering online services still have a long way to go.

The above review indicates that measuring the impact of E-banking has attracted much attention from researchers, at the international level but there has not been much analysis on the effect of E-banking on the service quality in the Indian banking industry. The present research paper attempts to fill this research gap and evaluate the factors affecting service quality and determines their effect on demographic variables and develops a model for Indian banking sector.

3. Research Methodology

This research work has been carried out to achieve the following objectives:

- To study the factors affecting the service quality of banks;
- To determine the effect various demographic variables on the factors affecting the service quality of banks, and
- To develop a model framework for Effective Service Quality in E-banking.

The research work is based on primary data collected through well structured questionnaire from 200 young respondents during the period of February 2012 to April 2012. The customers of five banks i.e. State Bank of India, Punjab National Bank, HDFC Bank, AXIS Bank and ICICI Banks were selected for the purpose of this research work. The banks were selected on the basis of their asset base structure and Net banking facilities provided by them. Personal contact method was used to collect data from the respondents.

Well structured questionnaire used for the purpose of study had two sections. First section contained questions regarding demographic profile of customers while second section contained a list of 20 statements pertaining to various attributes of E-banking. Purposive sampling method has been used to select the respondents keeping in view their net banking usage and socio-economic status. Five-point scales, ranging from strongly agree to strongly disagree, have been used for getting the responses on the select statements used in the questionnaire. Data so collected have been analyzed with the help of SPSS-13 version. To find the effect of factors on E-banking services, factor analysis technique has been used.

As demographic variables affect overall satisfaction of customers also other factors differently, following null hypothesis have been formulated and tested:

$H_0(1)$: There is no significant relationship between gender and factors affecting the service quality of E-banking.

$H_0(2)$: There is no significant relationship between age and factors affecting the service quality of E-banking.

$H_0(3)$: There is no significant relationship between education and factors affecting the service quality of E-banking.

$H_0(4)$: There is no significant relationship between occupation and factors affecting the service quality of E-banking.

4. Results and Discussions

Table 1(a) presents the demographic profile of the respondents. Majority of the respondents were male (79.5 per cent) and the females constituted only 20.5 per cent share of total sample. In terms of age groups, bulk of the respondents belonged to the age category of 21-30 (98 per cent) and a small portion, i.e., 2 per cent belonged to 31-40 years age group. The research work actually focused on the opinion of youngsters regarding E-banking. As far as respondents' education is concerned, highest number of respondents were post-graduate (69 per cent), followed by graduates (20 per cent) and the remaining were under-graduate (11 per cent). The data points to relatively high educational background of the respondents. In case of the occupation, 69 per cent of the respondents were from students' category while 31 per cent of the respondents were working.

Table 1(a)
Demographic Profile of Respondents

Demographic Variables	Demographic Characteristics	Frequency	Percentage (%)
Gender	Male	159	79.5
	Female	41	20.5
Age	21-30	196	98.0
	31-40	4	2.0
Education	Undergraduate	22	11.0
	Graduate	40	20.0
	Post Graduate	138	69.0
Occupation	Student	138	69.0
	Working	62	31.0

Source: Primary data, Survey Feb'2012-Apr'2012

In order to achieve the first objective and to find the factors affecting the service quality of E-banking, factor analysis was conducted. The reliability of the data was tested using Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett test of sphericity. The value of KMO statistics in Table 1(b) is >0.5, points that all the factors can not be considered equally important for measuring the service quality of E-banking. Bartlett test of sphericity shows the

value of Chi-square which is significant at 1 percent level of significance. These two tests show that the data is fit for conducting the factor analysis. The sampling adequacy measure was also tested for questionnaire in Table 1(b) and the value found to be 0.569, which is greater than 0.5 and falls between permissible limit of 0.5 to 1 and was considered as highly significant.

Table 1(b)
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.569
Bartlett's Test of Sphericity	Approx. Chi-Square	1020.824
	Df	190
	Sig.	.000

Source: Primary data, Survey Feb'2012-Apr'2012

The results of factor analysis with the variables, their names, factor loadings, reliability, Eigen values and percentage of variance has been presented in Table 1(c) The Principal Component Analysis Varimax Rotation was employed for extracting the factors. The process of extraction was stopped where the size of Eigen value has gone less than 1.0 and at that level it explained 63.798 per cent of the total variance. Large communalities indicate that a large

amount of variance has been extracted by the factor solution. A factor loading represents the correlation between an original variable and its factor. The criteria given by Hair (1995), where factor loading based on sample size taken as the basis for decision about significant factor loading, was adopted. The sample shows a factor loading of 0.4 and above which has been considered significant.

Table 1(c)
Naming of Factors and Their Factor Loadings

Name of Dimension	Name of Statements	Factor Loading	Reliability Values	Eigen	% of Variance
Authentication and Authorization	1) E-banking provides more punctuality, transparency and accountability.	0.223	.616	2.225	11.123
	2) It provides accuracy in billing.	0.368			
	3) E-banking ensures physical security of the transaction	0.372			
Acceptability	1) It reduces the waiting time to receive service	0.493	.865	1.929	9.643
	2) It is trusted by young generation most	0.505			
Security and Accessibility	1) E-banking service is accessible via internet banking, mobile banking and ATM.	0.267	.430	1.822	9.108
	2) It provides the up to date information	0.299			
	3) E-banking is necessary for the development of new economy of India	0.241			
	4) Password facility provides confidentiality to transaction	0.415			
Promotional Services	1) E-banking provides effective medium of promotion of various schemes.	0.269	.468	1.752	8.761
	2) It provides service at the designated time.	0.347			
	3) Response of service through E-banking is very quick and prompt.	0.525			
Competitive Advantage	1) Online purchase of goods and services including online payment is easier.	0.257	.315	1.743	8.714
	2) Transfer of funds is faster as compared to manual banking system	0.489			
	3) E-banking increases the reputation of the banks	0.429			
Data Integrity	1) It provides convenient location of service facility.	0.353	.567	1.686	8.430
	2) E-banking explains the service itself.	0.424			
	3) It assures customers that the problem will be handled.	0.504			
Ease of Use	1) Transfer of funds is easier through E-banking.	0.330	.432	1.604	8.019
	2) E-banking provides 24*7*365 days service to customers.	0.458			

Source: Primary data, Survey Feb'2012-Apr'2012

The factor analysis yielded seven factors which throw light on the most important variables included in each factor. The derived seven factors are: authentication and authorization, acceptability, security and accessibility, promotional services, competitive advantage, data integrity and ease of use.

Factor 1 - Authentication and Authorization:

This is an important factor which accounts for the maximum variations (11.123 per cent). Three out of twenty variables have been loaded on this factor. The Eigen values of more than 2 (highest among the rest of factors) also highlights that it is the most important factor in respect of service quality. The components included in this factor are punctuality, transparency, accountability, accuracy in billing, and physical security of the transaction. Actually, E-banking is considered more transparent by the respondents if every transaction can be checked and verified anytime.

Factor 2 - Acceptability:

The second factor which accounts for 9.643 per cent of the variations has been named as Acceptability. Two out of twenty variables have been loaded on this factor. The Eigen value more than 1.9 also highlights that it is also an important factor for service quality, as per the factor analysis. The statements included in this factor are reduction in waiting and trust-worthiness among the young generation. This indicates customers need not visit the branches which will reduce the waiting time. Further, the youth of today has trust on the e-operation of the bank.

Factor 3 - Security & Accessibility:

This factor also accounts for very high percentage of variations that equals to 9.108. Four out of twenty variables have been loaded on this factor. The Eigen value more than 1.8 also highlights that it is reasonably important factor with respect to our main objective. The variables included in this factor are ease of access, latest information, confidentiality and development of economy. The results disclose that many respondents agree that E-banking results in ease of access and provides more confidentiality of transactions.

Factor 4 - Promotional Services:

The fourth factor that emerges from the factor analysis has been designated as promotional services. This factor accounts for 8.76 per cent of the variations. Three out of twenty variables have been loaded on this factor. The Eigen value of more than 1.7 highlights that it is moderately important factor. The statements included in this factor are timely and prompt response and an effective medium of promotion of various schemes. Keeping in view the above analysis, most of the respondents agree to the statement that E-banking can be an effective medium for the promotion of various schemes.

Factor 5 - Competitive Advantage:

This factor, which accounts for more than 8.5 per cent of variations, is named as competitive advantage. Three variables out of twenty have been loaded on this factor. The Eigen value of 1.743 also highlights that it is slightly important factor for service quality. The statements included in this factor are quick and easy online purchase, convenient location and increase in reputation of banks. It can be concluded that most of the respondents agreed that E-banking provides a competitive edge to the banks and also enhances the reputation of the banks.

Factor 6 - Data Integrity:

This factor, which accounts for over 8.43 per cent of variations, has been named as data integrity. Three out of twenty variables load on this factor. The Eigen value of 1.686 highlights that it is an important factor of service quality. The variables included in this factor are convenient location, self explanation of service and assurance of problem handling.

Factor 7 - Ease of Use:

This factor, which accounts for over 8.019 per cent of variation, has been named ease of use. Two out of twenty variables have been loaded on this factor. The Eigen value of 1.604 also highlights that it is slightly important factor of service quality. The variables included in this factor are easy transfer of funds and round the clock service. It can be concluded that E-banking service available round the clock and throughout the year are preferred.

In order to achieve the second objective and to study the relationship between demographic variables and factors affecting the e-service quality of banks one way analysis of variance (ANOVA) has been used. Mean score was calculated for factors where significant relationship between independent variable (demographic) and dependent variables (authentication and authorization, acceptability, security and accessibility, promotional services, competitive advantage, data integrity, ease of use) was observed.

(i) Effect of Gender on Factors:

Table 2 (a) shows that there is a significant difference between the views of males and females on three factors: security and accessibility, competitive advantage and data integrity. The effect of gender on other four factors was found statistically insignificant. Therefore, the null hypothesis H_0 (1) is partially rejected. The perception of males and females vary up to a large extent in terms of these three factors of services quality of E-banking. Thus, it can be concluded that banks should consider these aspects more seriously while convincing their female customers.

Table 2 (a)
ANOVA between Gender and Various Factors (Significant)

Statements	Male	Female	F-value	Significance
Security & Accessibility	-.0983921	.3815693	7.764	.006
Competitive Advantage	-.1416064	.5491567	16.787	.000
Data Integrity	-.0744260	.2886278	4.369	.038

Source: Primary data, Survey Feb'2012-Apr'2012

(ii) Effect of Age on Factors:

Table 2 (b) clearly states that the null hypothesis H_0 (2) is rejected as age is found to be significantly related to the factor competitive advantage only. Respondents in the age group of 31-40 were found to be inline with the statement that E-banking plays a significant role in providing a competitive edge to one bank over the other. The difference

in the preference can be understood by the stage of their life cycle. Due to higher exposure of electronic media, the respondents were shifting towards E-banking . As they consider it convenient to make online purchases and then making online payments. Moreover the respondents in this age group also believe that E-banking increases the reputation of the banks.

Table 2 (b)
ANOVA between Age and Various Factors (Significant)

Statements	21-30	31-40	F-value	Significance
Competitive Advantage	-.0202709	.9932747	4.089	.044

Source: Primary data, Survey Feb'2012-Apr'2012

(iii) Effect of Qualification on Factors:

Null hypothesis H_0 (3) is also partially rejected as it is observed that three factors authentication and authorization, acceptability and data integrity have significant relationship with the qualification background. As evident from the Table 2 (c), one way ANOVA reveals that education has a considerable impact on the perception of the respondents regarding various services provided by the banks through

E-banking. The descriptive analysis shows that the respondents with the intermediate qualification (graduates) strongly agree with the factors that enhances the transparency, accuracy and security to the transactions and also makes the services and information available at any place and at any point of time. The reason for this can be the fact that the E-banking is mostly availed and accepted by the younger generation.

Table 2 (c)
ANOVA between Level of Qualification and Various Factors (significant)

Statements	Under - Graduate	Graduate	Post - Graduate	F-value	Significance
Authentication & Authorization	-0.7266386	0.4881970	-.0256654	11.770	.000
Acceptability	.5179506	-.0646950	-.0638197	3.396	.035
Data Integrity	-.7076401	.2600614	.0374321	7.406	.001

Source: Primary data, Survey Feb'2012-Apr'2012

(iv) Effect of Occupation on factors:

Null hypothesis H_0 (4) is also partially accepted as occupation is found to be significantly related to all except competitive advantage and ease of use. Table 2 (d) shows the results of ANOVA analysis on the various factors with respect to the occupation of the respondents. The results reveal that the non-working respondents (i.e. students) are more inclined towards the facilities and services provided by the banks than the working ones. The descriptive analysis, further justifying the results of one way ANOVA,

shows that the students strongly agree with the statements that E-banking provides the competitive advantage to the banks over the banks which don't offer the same. Moreover, they do agree with the fact that the e-banking service is quite easy to understand, use and access. The fact behind this can be that during the study period, the students travel throughout different place across the globe and in those circumstances e-banking can make the money available at any place at any point of time. Moreover during student life, the people are highly exposed and aware about the different innovations and up-gradation.

Table 2 (d)
ANOVA between Occupation and Various factors (significant)

Statements	Student	Working	F-value	Significance
Competitive Advantage	.1016532	-.2262602	4.685	.032
Ease of Use.	.0978818	-.2178660	4.337	.039

Source: Primary data, Survey Feb'2012-Apr'2012

Hence, it can be concluded from summary Table 2 (e) that gender has significant relationship with security and accessibility, competitive advantage, and data integrity whereas age is significant with only one factor i.e.

competitive advantage. On the other hand qualification has significant impact on authentication and authorization, acceptability and data integrity. Occupation has significant relationship with competitive advantage and ease of use.

Table 2 (e)
Summary results of ANOVA

Factors	Gender	Age	Qualification	Occupation
Authentication & Authorization	×	×	√	×
Acceptability	×	×	√	×
Security & Accessibility	√	×	×	×
Promotional Services	×	×	×	×
Competitive Advantage	√	√	×	√
Data Integrity	√	×	√	×
Ease of Use	×	×	×	√

(√) represents significant relation at 1 per cent and 5 per cent level of significance

Source: Primary data, Survey Feb'2012-Apr'2012

In order to develop a model framework for Effective Service Quality in E-banking, in the present study, customer satisfaction has been taken as dependent variable whereas authentication & authorization, acceptability, security & accessibility, promotional services, competitive advantage, data integrity and ease of use are taken as independent variables to develop a model. Responses have been taken on 5 point scale (where strongly Agree=1, Agree=2, Uncertain=3, Disagree=4, strongly Disagree=5). Hence lower

the mean score, higher is the agreement towards that statement.

Canonical Discriminant Function coefficients from Table 3 (a) yield coefficients of various factors. The Discriminant equation is as follows:

$$\text{Discriminant score} = .502(\text{Acceptability}) + .498(\text{Security \& Accessibility}) + .319(\text{Competitive advantage}) + .183(\text{Data Integrity}) + .129(\text{Promotional Services}) - .419(\text{Authentication \& Authorization}) - .473(\text{Ease of Use}).$$

Table 3 (a)
Canonical Discriminant Function Coefficients

Factors	Function
	1
Authentication & Authorization	-.419
Acceptability	.502
Security & Accessibility	.498
Promotional Services	.129
Competitive Advantage	.319
Data Integrity	.183
Ease of Use	-.473
Constant	.000
Unstandardized coefficients	

Source: Primary data, Survey Feb'2012-Apr'2012

Customers were more satisfied with the security and accessibility, competitive advantage, data integrity and promotional services was also good and moreover they accepted E-banking due to its convenience, saves time and cost. Hence it can be concluded that E-banking is more acceptable because of the promotional aspect, competitive advantage, data integrity and moreover it provides easy access i.e., anywhere, anytime banking.

Group centroid values from Table 3 (b) were used to compare the score of Discriminant equation. If the score of the equation is greater than $-.436$ then the respondents are expected to be satisfied and if score is less than $.130$ then they are not expected to be satisfied. Nothing can be said with certainty in case of discriminant score between $-.436$ and $.130$.

Table 3 (b)
Functions at group Centroids

Are you Satisfied with E-Banking services?	Function
	1
Yes	.130
No	-.436

Source: Primary data, Survey Feb'2012-Apr'2012

The Classification results from Table 3 (c) provide the strength to Discriminant equation. The respondents were divided into two groups using Bernoulli function and 70 per cent of the cases were selected for predicting Discriminant equation. The rest 30 per cent cases were used for checking the strength of Discriminant equation. Almost 65.6 per cent of the selected cases were correctly classified and 47.8 per cent of the unselected cases were correctly classified.

Discriminant equation correctly classifying the cases more than 62 per cent is considered good. So the results were good. Hence it can be concluded that authentication & authorization, acceptability, security & accessibility, promotional services, competitive advantage, data integrity and ease of use are almost up to the mark and customers are also satisfied with the service quality of E-banking.

Table 3 (c)
Classification Results

Are you Satisfied with E-Banking services?		Predicted Group Membership		Total
		Yes	No	
Original Count	Yes	101	53	154
	No	22	24	46
%	Yes	65.6	34.4	100.0
	No	47.8	52.2	100.0

62.5 per cent of original grouped cases correctly classified

Source: Primary data, Survey Feb'2012-Apr'2012

5. Conclusion

In light of the research and analysis done it can be concluded that, internet banking is marked by the factors such as authentication & authorization, acceptability, security & accessibility, promotional services, competitive advantage, data integrity and ease of use. Authentication & authorization, acceptability and data integrity are being considered as the major factors that strongly affect the overall satisfaction of online consumers. Security & accessibility, promotional services, competitive advantage and ease of use are considered to be reasonably affecting the overall contentment and satisfaction of customers using internet banking services. However, in order to enhance customers' satisfaction, it is unavoidable for banks to give equal weightage to all the above-mentioned factors.

The study also revealed that gender has significant relationship with security and accessibility, competitive advantage, and data integrity whereas age is significant with only one factor i.e. competitive advantage. On the other hand qualification has significant impact on authentication and authorization, acceptability and data integrity. Occupation has significant relationship with competitive advantage and ease of use.

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